Individuality and Education

A prominent scientist, educator and author points to the cumulative evidence as to the wide range of human variability. He suggests some of the tremendous implications of this evidence for the organization and conduct of the schools.

That differences between individuals exist has been recognized about as long as men have reflected about themselves. Adequate detailed knowledge about these differences is, however, lacking in this modern day when we have detailed knowledge about so many other things. We lack definitive knowledge regarding what the distinctive factors are, how they arise, their magnitude and their distribution in the population.

As a consequence we are ignorant regarding the implications of the facts we do not have. Any intelligent decision as to how important individual differences are, and any discussion of what should be done by way of adjustment, must rest upon knowledge rather than surmise and inference.

Up to the present time scant attention has been paid to studying these differences, partly because these exceptions stand in the way of generalization and we want to “go scientific” and generalize, and partly because studying differences seems to be flying in the face of the idea of the brotherhood of man, and the concept that all men are created equal. Any idea which seems to meet head on both the scientific urge to generalize and the religious and political ideas of brotherhood and equality, might be expected to meet resistance.

To disarm my critics I will say immediately that I believe in science and generalizations, also in the brotherhood of man and the principle that all men should be equal before the law. It is only aberrations of these ideas that I call in question. Generalizations are the life blood of science but spurious generalizations can only poison it. Men are not and never have been identical, and any conclusions that rest upon the premise that they are, must be false. Harmonious relations among human beings will be enhanced—not decreased—by knowledge about existing differences. Knowledge is power in this realm as well as any other, and ignorance has but one color—black.

It is surprising from one point of view that we have so little satisfactory knowledge about these differences, especially when we consider that they are in essence the foundation of our desire for liberty and the freedom to make our own decisions. If it were not for differences there would be no reason for religious liberty, for example; a religion that would satisfy one, would satisfy all and there would only be happy conformists. If human differences are of a trivial nature, then we have been guilty of making a great hubbub over trivialities and the idea of anyone preferring liberty to death seems absurd in the extreme.

There is no doubt, however, that many people regard the liberty which allows them to make their own decisions—based upon their own differences—as crucially
important. This is reason enough to enquire into the subject of differences, and to become thoroughly acquainted with them.

A recent revision of an older book on human differences (1) reflects a widespread attitude—that of trying to make human differences look as small as possible in the hope, I presume, that this would bolster up the idea of human brotherhood and equality. Wechsler actually states, "... it will be possible, I believe, to show that human variability ... is extremely limited...." History demonstrates that when anyone sets out deliberately to show or prove something, he is usually able to come out with a conclusion that is satisfactory to himself and in line with his original purpose. Wechsler's book constitutes no exception.

What Is the Evidence?

There is now, however, a vast amount of cumulative evidence, much of which has only recently been assembled (2) which clearly justifies the view that human variability in anatomy, physiology, biochemistry and psychology is extremely pronounced. With respect to some of the items that can be measured with definiteness and precision, ranges of variation are, or appear to be, 5-fold, 10-fold or even more.

Some of the items for which ranges of 5-fold, 10-fold or more appear to apply, on the basis of the best available evidence are: sizes of stomachs, livers, kidneys, spleens, testicles, ovaries, thyroids, parathyroids, pituitaries, adrenal cortices, the numbers of islets of Langerhans in the pancreas, numbers of each of four specific types of leucocytes in the blood, of eleven specific types of cells in bone marrow, the histamine content of the blood, the protein bound iodine content of the blood, the content of several lipid fractions of blood, at least five enzymes in blood plasma, at least three enzymes in erythrocytes, calcium phosphate in bone, magnesium in saliva, urinary excretion of estrogens, urinary excretion of androgens, urinary excretion of the lactogenic hormone, urinary excretion of several amino acids, nutritional needs for calcium, nutritional needs for certain amino acids, nutritional needs for five or more vitamins, level of alcohol in the blood required to produce intoxication, concentration of mercuric chloride required to produce skin irritation, Schneider indices (neurocirculatory efficiencies), results of "cold pressor" tests, ability to detect weak electric currents, taste thresholds for most common substances.

Because of lack of direct study, much of the evidence for these wide variations has been recorded inadvertently by investigators who had interest in matters quite aside from human variation. Direct interest is necessary in order that the items listed above and many others be checked and rechecked and the dependability of the information increased.

Three additional points with respect to the differences themselves need to be made. First, the list of items above is not a comprehensive one; it is only representative. Second, differences need not be large to be significant; hence the items we have listed in which variations are large are representative of only a fraction of those that are significant. Third, there are many important differences which cannot be stated in mathematical terms, for example, the very large differences in shape and structure of human hearts and brains, and multitude of nerve patterns, muscle patterns and tendon patterns which are distinctive for each individual.

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One area that should be of special interest to educators is that of the structure of human hands. Eleven diagrams are necessary to depict the variations of the attachments of one muscle alone—the extensor muscle of the index finger. Eight distinct patterns of tendons on the back of the hand have been recognized. Human hands are by no means assembly line products and this accounts for the well known fact that handwriting is distinctive for each individual. It also accounts for the fact that some otherwise normal individuals are wholly unable to write presentably.

Lashley (3) states with respect to our brains, "The brain is extremely variable in every character that has been subject to measurement. Its diversities of structure are of the same general character as are the differences between related species or even between orders of animals... Individuals start life with brains differing enormously in structure, unlike in number, size and arrangement of neurons as well as in grosser features." It is worthy of note that, according to neuroanatomists, nerve cells do not multiply during growth and development, so that the fundamental cellular structure of the brain is determined at birth.

It will be interesting to those who have dabbled with the problem of individual differences to know that the items listed above are different from those more often considered. Wechsler in his book cites over one hundred items but does not include a single one which we have cited.

If one is seeking to minimize the variation that exists, he will do well to concentrate attention on composite items, those made up of many parts, such as basal metabolic rate (the summation of the oxygen consumption of every organ, tissue and cell in the body) or intelligence quotients (the summation of various types of mental abilities). If one looks at specific organs, tissues and cells, then the differences may be large indeed. If we test individuals for specific types of mental abilities, we may find enormous differences with respect to each type; yet their summed up abilities (IQ's) may appear about the same.

A most important fact which has too often been overlooked, relates to the distribution of extreme values (with respect to any measurement) in the general population (4). If a certain few individuals, who could be regarded as freaks possessed the extreme characteristics for the whole population, then they could be set aside for special treatment. Such is not the case; the extreme values (within the normal range, if you will) are distributed throughout the whole population.

The concept of an average person or student is that of one who is about average in almost every way. If we divide the whole range of values for any measurement into (a) a lower quartile, (b) a median 50 percent, and (c) an upper quartile, the chance is one out of two that any randomly selected individual will be about average (fall in the median 50 percent) with respect to this measurement. But if we have sixty independent measurements, the chance that any individual will be in the median 50 percent in all, is about one in one quintillion. The person or student who is about average in every way had better be disregarded, because there is no evidence that he or she exists.

There is no doubt that the observed differences in people are to a large degree genetically determined. Each one, however, has so many diverse capabilities, that the sum total of his or her life may be outstanding. Few if any of us live even approximately up to his or her potentialities.

In the field of mentality, for example, there are a large number of facets. Not
only are there “primary mental abilities” such as arithmetical facility, word familiarity, spatial imagery, etc., which are involved in the performance of traditional schoolwork but in addition there are musical, poetic, artistic, inventive, creative and social gifts which are also surely related to intelligence. Each individual possesses a highly distinctive pattern of mind which makes it possible for him or her to be adept in certain ways and at the same time probably conspicuously inept in others. The simple classification of minds as “good” and “poor” is puerile and quite misleading.

One of the difficulties involved in learning more about the differences that exist between people, is that individuals are not static but are subject to stresses and capable of adaptation and education to such an extent that intra-individual differences can complicate the study. Nonetheless the inter-individual differences which have anatomical, physiological and biochemical bases, are fundamental and can be fully investigated if we will.

Implications

The implications of what we have been saying are so far-reaching as to be overwhelming. I doubt whether the facts that we have considered could be the basis for any immediate revolution in the organization or fundamental conduct of our schools. Should we have special classes for “exceptional children”? Perhaps so, but we will have difficulty in drawing the line of demarcation. Children are characteristically exceptional, each in his or her own way. Also we must not forget that human beings have to live together, students need to be together, they need to learn self-discipline and to accept their social responsibilities and play their own roles as members of the human family. I suspect, however, that if we had a full appreciation of the degree of individuality which exists the content of our schoolwork would be changed materially. To load up the mind with more and more information may be “just the thing” for some individuals; for others, this approach may be worse than useless. And as Thirring (5) has pointed out there is a general need in education for inculcating practical “wisdom,” regarding human potentialities, human responsibilities and human relations.

It seems to me that the immediate educational implications of the high degree of individuality which exists (whether we recognize it or not) include the importance of teachers’ learning more and more about this individuality so that the concrete evidences of it which they encounter every day can be tolerated and dealt with, and to a degree understood. Research designed to find out more facts about individuality is desperately needed and there is no reason why educators throughout the country should not become research minded with respect to this highly pertinent area.

Another highly important implication for education is the desirability of children in nursery school and at every level becoming acquainted with their own and their schoolmates’ differences. Small children have very substantial differences with respect to their senses of sight, hearing, smelling, tasting, and the touch senses, as well as in motor skills, reactions to music, etc. Why not help them gain insight into themselves and their mates, which will make it easier for them to live continuously with themselves and with their fellows? We have been guilty of developing in children a bad psychology which is carried over into adulthood—namely that of dislike for anyone who is different. When the facts of individuality are known, this attitude becomes absurd.

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One of the important functions of public education is to get each student acquainted with himself to the end that he can make the most of his life and thus contribute to the public weal. To get acquainted with his own being is highly important. This cannot be accomplished without also gaining knowledge of the individuality of others; this knowledge figures intimately in every facet of his life, because he is a social creature.

References

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Educational Dilemmas

Though facing today’s unusual pressures, the school still must attempt to provide its burgeoning population with a program that exemplifies the best that is now known about how children and young people grow and learn.

Higgledy, piggledy
My black hen
Are we to build schools
For gentlemen?

RECENT articles and proposals would make us think so. Are the schools to adopt the European system? Why this mounting pressure? Schools are always under pressure to change or not to change. Unusual uneasiness existing everywhere, however, tends to produce greater sensitiveness to pressure groups. Schools responding, sometimes enthusiastically embrace procedures that should be examined more critically. The educational dilemma at present is that the schools are short, yes, very short—short of money, short of teachers, short of buildings, but long on children!

Higgledy, piggledy
My black hen
They come in groups
Sometimes nine, sometimes ten.

The hordes of children for which America is grateful and proud create a severe problem and a challenge. Is it possible for our land to offer to all, free educational choice? Of what shall that choice consist? Are most children early to be channeled into groups according to some artificial screening? These questions deserve most serious consideration.

The American dream would provide all children opportunity to complete a high school education. This, however, is becoming increasingly difficult. Along with the burgeoning hordes has come a